SUPPLY CHAIN MANAGEMENT
PT. GREENTEX INDONESIA UTAMA II

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ABSTRACT

PT Greentex Indonesia Utama II is engaged in the service of making clothes, jackets and pants according to customer orders. The production strategy used by the company is make to order, that is, production is carried out if it receives a purchase order from Head Marketing PT Greentex Utama. Problems faced by the company include difficulties in determining the amount of raw materials to be ordered, there have been several shortages of raw materials when ordering and the company does not keep stock of raw materials because each raw material for production is determined by the customer and is always different. Another problem is the lack of late production process information to Marketing Production, this causes distribution to be late and not according to the distribution schedule that has been sent to the Head Marketing. One way to help companies solve their problems is to build a supply chain management information system, because it has the function to integrate business processes from the initial supplier to the end user. The method used is Just In Time to determine the amount of raw materials to suit production needs. The results of this research are supply chain management information systems that can help companies order raw materials so that the amount is in accordance with production needs and the number of products ordered and helps in knowing the distribution schedule based on the production process.

Keywords : Just In Time, Make to Order, Supply Chain Management

1. INTRODUCTION

PT Greentex Indonesia Utama II is a subsidiary of PT Greentex Utama located in Korea. PT Greentex Indonesia Utama II is engaged in the service of making clothes, jackets and pants according to orders from customers who are not directly related to the company, but orders are made through buyers who will send product order data from customers to PT Greentex Utama. The production strategy used by the company is make to order, which is the production process carried out if it receives a purchase order (PO) from PT Greentex Utama. Supply chain activities at PT Greentex Indonesia Utama II consist of downstream to upstream, which is involved downstream, namely Marketing Production in receiving purchase orders (PO) and EXIM in the process of shipping products to cutomers who use shipping services, while those involved in upstream are PPIC in ordering raw materials to suppliers, Adm Sewing and Adm Packing in processing raw materials into products.

The results of an interview with Mr. Parudin as Marketing Production, explained that the production was carried out when receiving an email purchase order (PO) from the Head Marketing of PT Greentex Utama. Purchase order (PO) received contains customer data, product data ordered along with the amount, the product date can be received by the customer (PODD) and there is data of raw materials that have been determined by the customer. Marketing Production will create an order list based on the purchase order (PO), the order list that has been created will be sent to PPIC. Marketing Production will wait for the production schedule from PPIC to make a distribution schedule based on the production completion date stated in the production schedule. Distribution schedule that is made will be sent to Head Marketing no later than 14 days after the purchase order (PO) email is received by Marketing Production to provide information related to the product delivery date and the date the product can be received by the customer whether exceeding the date requested by the customer (PODD) or not . Until now the production process sometimes does not run according to the production schedule that has been made by PPIC and Marketing Production does not always get information related to the production process that is not in accordance with the production schedule, resulting in product distribution being delayed and not according to the distribution schedule that has been informed to Head Marketing.

The results of an interview with Ms. Yosie Octavia as Production Planning and Inventory Control (PPIC), explained that the process of procuring raw materials is carried out based on the order list obtained from Marketing Production, the order list contains the product order list from the customer along with the details of the specified raw materials by the customer. Procurement of raw materials is done per customer and raw materials to

be ordered to suppliers are taken based on raw materials that have been determined by the customer. The amount of raw material procurement is usually calculated and adjusted to the number of products ordered, until now the number of raw material procurement still occurs shortages seen from July 2018 to December 2018 there are 17 times the shortage of 70 times the procurement of raw materials so that it can result in the production process not being finished on time and had to re-order raw materials. Ordering of raw materials to the supplier is carried out in accordance with the order date (LCO) listed in the raw material procurement data, so far the ordering of raw materials is done without seeing the same raw materials, if there are the same raw materials for different products ordering raw materials to the supplier is done in recent times so that the cost of ordering increases.

The results of research conducted by Ni Luh Utami Dewi, Anjuman Zukhri, and Tripahupi Endah Lulup on "Analysis of Cost Efficiency of Raw Materials in the Application of JIT Method in Karya Karang Karang Asem Tiles Industry" which discusses the application of the Just In Time (JIT) method is able to handle problems in purchasing raw materials to fit the production needs [1]. Based on the problems that have been described, PT Greentex Indonesia Utama II requires a Supply Chain Management (SCM) information system using the Just In Time (JIT) method to deal with existing problems.

2. CONTENTS

2.1 Information Systems

Information systems are networks that are interconnected and work together in carrying out certain activities to provide information to recipients of information in order to support faster decision making [2].

2.2 Supply Chain Management

Supply Chain Management (SCM) is a management that manages information from the initial supplier to the customer, both information goods and services using a system approach that is integrated with one another with one goal. The basic principles of SCM include the principle of integration, the principle of networking, the principle of end to end, the principle of interdependence, and the principle of communication [3].

2.3 Supply Chain Management Component

Components of Supply Chain Management consist of three main components namely [4] :

1. Upstream Supply Chain
   Relationships with distributors for distribution activities can be extended to several other distributors with different levels. Procurement of goods or raw materials is one of the main activities of this supply chain.
2. Internal Supply Chain
   The process that occurs within the company which involves the distribution of goods or raw materials to the warehouse. Processing goods or raw materials into a product and inventory management so that it is not empty is the main activity of this supply chain.
3. Downstream Supply Chain
   The main activity in this supply chain is to distribute products to customers, both by the company and by shipping services.

2.4 Push and Pull Supply Chain Management

Push Supply Chain is a system that produces a large number of units and is not fixed to the number of orders from customers because every product produced from production will be stored in a warehouse before being distributed to customers. The push supply chain system is most appropriate for logistics procurement.

Pull Supply Chain is a system that produces one unit and then is moved to the place that needs it. The immediate production process is the concept of this supply chain and can work with several suppliers of raw materials or goods. With the concept of using a very small lot size with the amount needed so as to be able to remove the accumulation of inventory that can cause problems.

Push and Pull Supply Chain is a strategy that uses an approach between push and pull. Push is an activity prior to the production process, while pull activities that start from the production process are carried out based on requests from customers [3].

2.5 Inventory Management

Inventory is one of the most active elements in operations companies that are continually acquired, changed, and then resold. Most of the sources companies are also often linked in inventory to be used in factories. Inventory value must be recorded, classified according to the type which is then made. The details of each item in a period concerned. This means, in the presence of inventory allows operation production, due to factors time between operations it can be minimized or eliminated altogether completely by better planning for production [5].

2.6 Monitoring

Monitoring is an activity carried out to monitor activities as well as monitor goods through the system and to find out whether the activities being carried out are in accordance with the plan or not so that problems can be identified when they are not as planned and can be directly addressed.

Monitoring Objectives, including [6] :

1. Assess whether the activities carried out in accordance with the plan.
2. Identifying problems that arise so that they can be directly addressed.
3. Assess whether the work and management patterns used are appropriate to achieve the objectives of the activity.
4. Knowing the relationship between activities with the aim to obtain a measure of progress.

5. Adjust activities to the changing environment, without deviating from the goals.

2.7 Just In Time (JIT)

Just In Time is an ongoing approach to solving forced problems that focus on output and reducing inventory use. The point of JIT is a philosophy of problem solving that is always ongoing, in short JIT only makes what is needed. By forcibly resolving problems that are focused on less output and inventory, JIT provides a powerful strategy for improving various business operations. With JIT, materials are needed where and only when needed. When an item is not the time is needed, that is the "problem". By reducing waste and delays, JIT will reduce the costs associated with inventory excess and usually useful in support of rapid response strategies and cost reduction [7].

Just In Time. The outline is divided into two types, namely Just In Time Purchasing and Just In Time Production. Just In Time Purchasing is a system of purchase items with the amount and the right time so that the item can be received immediately to fulfill the request or to use. Just In Time Production is a production system that is in principle. Only produces the types of goods that are requested a number of what is needed and when needed by consumers [8].

2.7.1 The Principle Of Just In Time

There are eight principles that should be used as a basis for determining the production strategy system in order to produce a good Just In Time method, including [9] :
1. Produce products according to a schedule based on customer requests.
2. Producing in small quantities (small lot size).
3. Eliminating waste.
4. Improve production flow.
5. Improve product quality.
6. Responsive people.
7. Eliminating uncertainty.
8. Emphasis on long-term maintenance.

2.7.2 Just In Time Inventory

Inventories in production and distribution systems are usually just in case if something goes wrong. Atinya, inventory is only used if there is a change in production plans. Then this excess inventory is used to cover changes or problems. Effective inventory tactics must be "just in time" and not "just in case". Just in time inventory is the minimum inventory needed to keep a system running perfectly. With just in time inventory, goods arrive when needed [10].

2.8 Analysis Of On Going Procedures

The procedures involved in this system are the procedure for ordering products, ordering raw materials, producing processes, and distributing products.
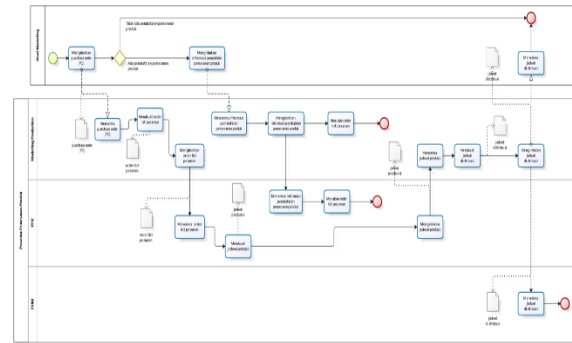
1. Product Order Procedure

Figure 1. Product Order Procedure
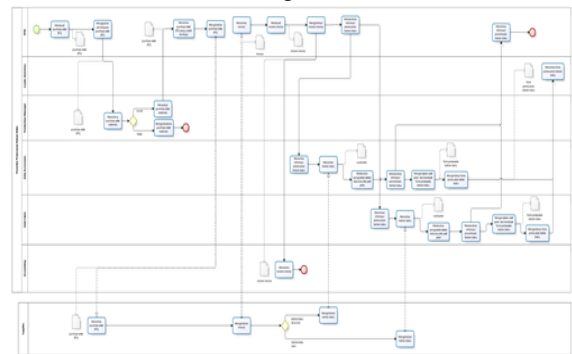
2. Raw Material Ordering Procedure

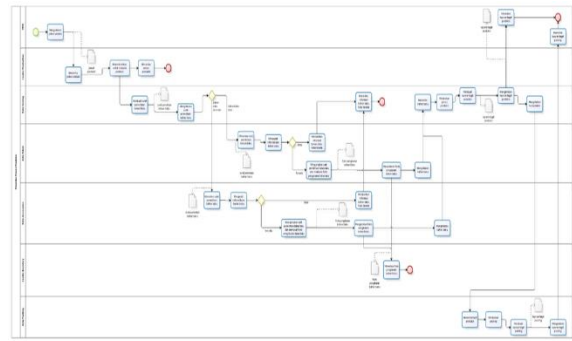**Figure 2.** Raw Material Ordering Procedure

3. Production Process Procedures

Figure 3. Production Process Procedures

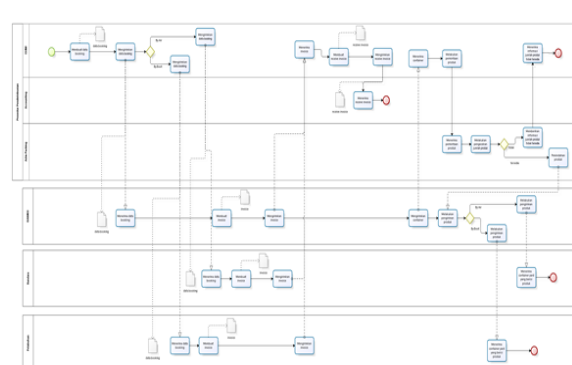4. Product Distribution Procedure

Figure 4. Product Distribution Procedure

2.9 Supply Chain Management Model

The supply chain framework at PT. Greentex Indonesia Utama II can be mapped. This mapping includes the components involved with the company can be seen in Figure 5.
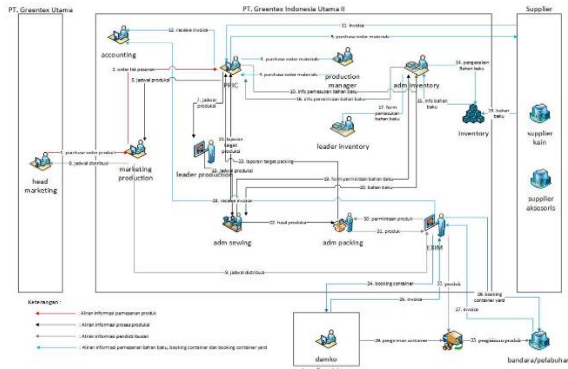

Figure 5. Supply Chain Management Model

2.10 Supply Chain Management Analysis

Analysis is carried out to describe the supply chain management process that will be built in the company based on the supply chain management model. Following are the stages of supply chain management analysis can be seen in Figure 6.
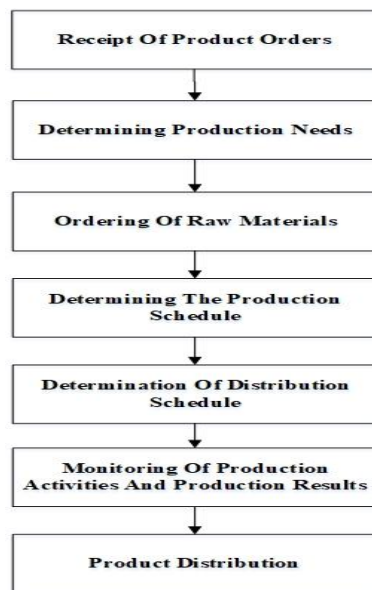

Figure 6. Supply Chain Management Analysis

2.10.1 Receipt Of Product Orders

This stage is the stage in analyzing product order data obtained from Head Marketing of PT. Greentex Utama in Korea.

2.10.2 Determining Production Needs

This stage is the stage in analyzing the production needs to conduct production of each product ordered. The stages of determining production needs are carried out using the Just In Time (JIT) method where the purpose of the Just In Time method is to improve production flow from starting to determine raw materials for ordering,

controlling raw materials for inventory if there are defective products so that the production process runs smoothly according with a tightened production schedule without constraints of shortage of raw materials [7]. At this stage, it is divided into two stages, namely determining the amount of raw materials and controlling raw material inventory. The following description of these stages :

1. Determination of the Amount of Raw Materials.
   This stage is the stage to determine the amount of raw material requirements based on product ordering data and production needs obtained from the raw material composition data for each type of product.
2. Controlling Raw Material Inventory.
   This stage is the stage for controlling inventory when there are defective products when production is done. The raw material for this inventory is used to reproduce the product in lieu of defective products.

2.10.3 Ordering Of Raw Materials

This stage is the stage for ordering raw materials from suppliers. Orders for raw materials are made to suppliers who are already bound by contracts or cooperation with companies. Ordering of raw materials is based on raw material procurement data, where the raw material procurement data contains the customer list and details of the raw materials requested by the customer.

2.10.4 Determining The Production Schedule

This stage is the stage to find out the production schedule. The production schedule is obtained based on Request Delivery Date (RDD) which is listed on the raw material procurement data.

2.10.5 Determination Of Distribution Schedule

This stage is the stage to determine the distribution schedule. Distribution schedule is obtained based on the date of completion of the production listed on the production schedule data.

2.10.6 Monitoring Of Production Activities And Production Results

This stage is the stage to find out the ongoing production process. In monitoring the production process can know when the production is completed.

2.10.7 Product Distribution

This stage is the stage for managing data distribution. Distribution is based on the distribution schedule carried out by the shipping service by sending the product to the customer through the Airport or Port, depending on the request of each customer.

2.11 Hardware Requirements Analysis

Hardware requirements analysis is used to find out some minimum hardware specifications that can support the running of the system to be built. The following hardware requirements can be seen in Table 1.

Table 1. Hardware Requirements Specifications

Development	Server	Client
1. Processor intel core to duo 2. Harddisk 500 GB 3. RAM 2 GB 4. Internet *cable / external* model 5. Keyboard 6. Mouse	1. Processor intel core to duo 2. Harddisk 120 GB 3. RAM 2 GB 4. Internet cable / external modem 5. Keyboard 6. Mouse	1. Processor intel core to duo 2. Harddisk 40 GB 3. RAM 512 MB 4. Internet cable / external modem 5. Keyboard 6. Mouse

2.12 Software Requirements Analysis

Software requirements analysis is used to find out some software needed to support the use of the system to be built. The following software requirements can be seen in Table 2.

Table 2. Software Requirements Analysis

Development	Server	Client
1. Operating system windows 10 2. Visual Studio Code 3. XAMPP 4. Web Browser	1. Operating system windows 7 2. Web Browser	1. Operating system windows 7 2. Web Browser

2.13 Use Case Diagram

Use case diagrams are used to describe the function of a system so that it can describe the needs of users. The following use case diagram can be seen in Figure 7.
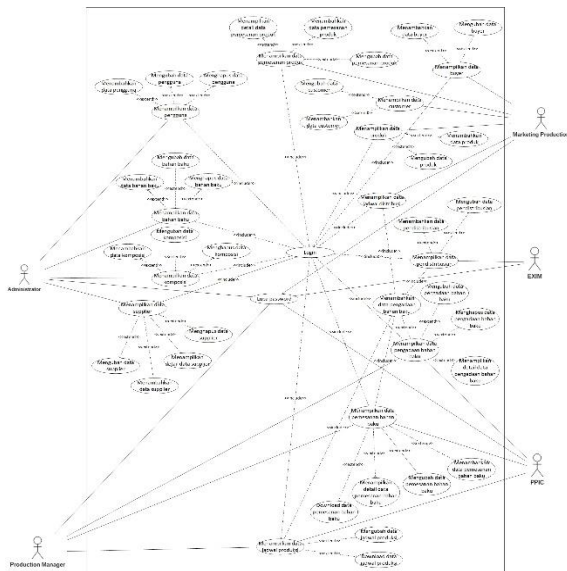

Figure 7. Use Case Diagram

2.14 Class Diagram

Class Diagram illustrates the relationship between objects on the system. Class diagrams include the attributes and methods that exist in each class. The following class diagram can be seen in Figure 8.
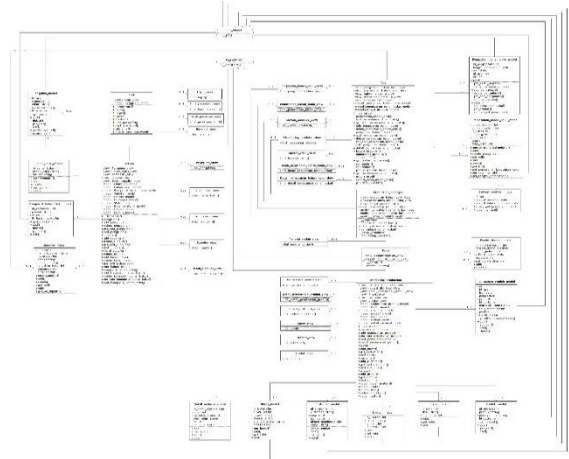

Figure 8. Class Diagram

2.15 Relationship Diagram

Relationship diagram is the stage where each data that has a primary key and is interconnected with other data will be correlated so that each relationship is clearly drawn from the data designed. The following relation diagram can be seen in Figure 9.
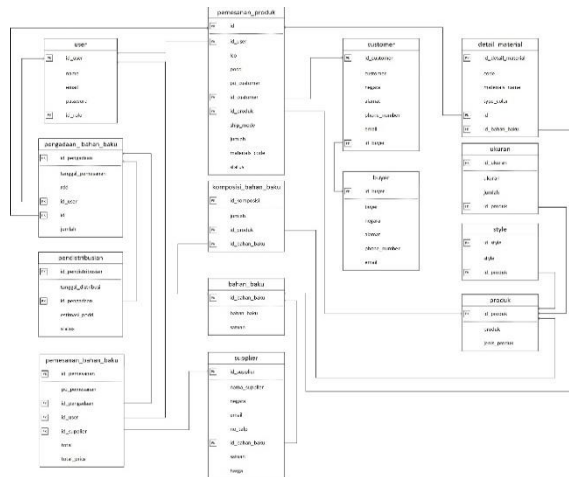

Figure 9. Relationship Diagram

2.16 Interface Design

Interface design is done to determine the interface of a program or system to be built so that the interface of the system is based on interface design. The following interface design can be seen in Figure 10.
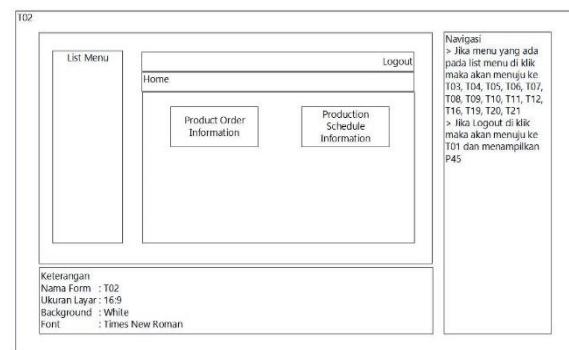

Figure 10. Homepage Interface Design

3. CLOSING

3.1 Conclusion

Based on the results obtained in the research conducted, the following conclusions can be drawn :

1. The information system built can help Marketing Production in knowing information on the distribution schedule in accordance with the production process. As for the shortcomings of the information system that is built, namely in providing distribution schedule information there is no notification given by the system if there is a new distribution schedule and if there are changes to the production process and the production schedule is not updated then the distribution schedule will not change.

2. The information system that was built can help PPIC (Production Planning and Inventory Control) in ordering raw materials based on the data of raw material procurement and the same type of raw material from different products. The shortcomings of the information system that is built is that in ordering raw materials the system does not provide detailed information on raw materials from each of its customers.

3.2 Suggestion

The suggestions for developing this information system so that it is even better are as follows :

1. The information system that has been built needs to be improved to find out all the information entered by giving notification to certain sections.

2. The information system that has been built needs an improvement on the ordering of raw materials to find out all the details of the raw materials for each customer.

3. The information system that has been built needs the management of production machine data to improve production scheduling so that it is more effective and can find out which product information is produced on which machine.

4. The information system that has been built needs to improve its appearance to make it more attractive.

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